

Entropy Production in Affine Inflation

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Multiple scalar fields nonminimally interacting through pure affine gravity are considered to generate primordial perturbations during an inflationary phase. The couplings considered give rise to two distinct sources of entropy perturbations that may not be suppressed in the long wavelength limit. The first is merely induced by the presence of more than one scalar and arises even in the minimal coupling limit. The second source however is restricted to nonminimal interaction. Unlike the case of metric gravity, and due to the absence of anisotropic stresses, the second source disappears for single scalar, showing that nonminimal couplings become relevant to non-adiabatic perturbations only when more than one scalar field are considered. Hence the notion of adiabaticity is not affected by the transition to minimal coupling contrary to the metric gravity case where it becomes frame-dependent. Precise data that might be able to neatly track different sources of isocurvature modes, if any, must not only distinguish between different models of inflation but also determine the most viable approach to gravity which underlies the inflationary dynamics itself.

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